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Self-admission to inpatient treatment in anorexia nervosa: Impact on healthcare utilization, eating disorder morbidity, and quality of life

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Abstract

Objective: Little evidence exists concerning the optimal model of inpatient care for patients with longstanding anorexia nervosa (AN). Self-admission has been developed as a treatment tool whereby patients with a history of high healthcare utilization are invited to decide for themselves when brief admission is warranted. The aim of this study was to evaluate the impact of a self-admission program on healthcare utilization, eating disorder morbidity, health-related quality of life (HRQoL), and sick leave for patients with AN.

Method: In this cohort study, 29 participants with AN in a Swedish self-admission program were compared to 113 patients with longstanding illness but low previous utilization of inpatient treatment, matched based on age, illness duration, and body-mass index (BMI). Data on healthcare utilization, eating disorder morbidity, and sick leave were obtained from national population and eating disorder quality registers.

Results: Participants displayed a >50% reduction in time spent hospitalized at 12-month follow-up, compared to nonsignificant changes in the comparison group. A sensitivity analysis comparing participants to a moderate-utilization comparison subgroup strengthened this observation. In contrast, the approach did not affect participants' BMI or eating disorder morbidity. Regarding HRQoL, mixed results were observed. In terms of sick leave, a beneficial but nonsignificant pattern was seen for participants.

Discussion: These findings indicate that self-admission is a viable and helpful tool within a recovery model framework, even though it does not lead to symptom remission. In its proper context, self-admission could potentially transform healthcare from crisis-driven to pre-emptive, and promote autonomy for severely ill patients.

KEYWORDS

anorexia nervosa, feeding and eating disorders, inpatients, patient admission, patient participation, voluntary admissions

1 | INTRODUCTION

Treatment for anorexia nervosa (AN) can often be successfully administered in outpatient settings (Brockmeyer, Friederich, & Schmidt, 2018; Keel & Brown, 2010). However, in as many as 20–30% of individuals with AN, the course of illness becomes prolonged and may lead to enduring disability (Dobrescu et al., 2020; Eddy et al., 2017). This clinical presentation has come to be referred to as severe and enduring AN (SE-AN) (Broomfield, Stedal, Touyz, & Rhodes, 2017), but there is little consensus in the literature regarding an exact definition of this condition (Hay & Touyz, 2018; Wildes et al., 2016; Wonderlich, Bulik, Schmidt, Steiger, & Hoek, 2020). Some AN patients require lengthy periods of inpatient treatment and relapse after discharge is common—a scenario that risks evolving into a "revolving door" pattern (Wonderlich et al., 2020). Unfortunately, there is still little evidence concerning the optimal model of inpatient care for patients with longstanding AN (Wonderlich et al., 2020) and unlike psychiatry in general, the hospitalization rate for this group has not been markedly reduced in recent decades (Papadopoulos, Ekbom, Brandt, & Ekselius, 2009).

Self-admission has been offered in Norway and the Netherlands for over a decade as a tool in the treatment of longstanding mental illness such as schizophrenia, bipolar disorder, and borderline personality disorder (Strand & von Hausswolff-Juhlin, 2015). Similar programs have been introduced in Sweden (Eckerström et al., 2019; Strand, Gustafsson, Bulik, & von Hausswolff-Juhlin, 2015; Westling et al., 2019) and Denmark (Thomsen et al., 2018). The self-admission model has previously been described in detail in this journal (Strand et al., 2015; Strand, Bulik, von Hausswolff-Juhlin, & Gustafsson, 2017). In self-admission, patients who are well known to a service and who have a history of high utilization of inpatient/residential treatment are invited to decide for themselves when brief admission—usually 3–7 days at a time—is warranted. Participants self-admit by contacting the designated ward directly. They are also free to discharge at will. Central to the approach is that the patients' reasons for choosing to self-admit are not questioned. Participants are welcome to admit themselves because of deteriorating mental health, acute stress, lack of structure in everyday life, loneliness, or any other reason. Hence, the traditional inpatient admission model with a clinician serving as gatekeeper is bypassed.

The rationale behind self-admission includes increasing patient autonomy and agency, promoting early help-seeking, reinforcing the asylum function of the inpatient ward, avoiding coercive interventions, and reducing total time spent in inpatient treatment (Strand & von Hausswolff-Juhlin, 2015). Patients in self-admission programs usually have a history of multiple and prolonged hospital admissions. Hopefully, encouraging self-monitoring of their mental health status and allowing swift help seeking can minimize the lag between first signs of deterioration and hospital admission, which may in turn reduce the need for prolonged episodes of inpatient treatment. However, some concerns have been raised regarding priority setting and cost-effectiveness in these programs (Strand & Sjöstrand, 2019).

Pilot studies on Norwegian self-admission programs targeting patients with schizophrenia and bipolar disorder have been promising: time spent in inpatient treatment was reduced by 22–56% and time spent in involuntary inpatient treatment by 51–61% across studies (Hanneborg & Ruud, 2011; Heskestad & Tytlandsvik, 2008; Sollied & Måsø Helland, 2010; Støvind, Hanneborg, & Ruud, 2012; Tytlandsvik & Heskestad, 2009). More recent controlled studies in the same patient groups from Norway (Sigrunarson, Moljord, Steinsbekk, Eriksen, & Morken, 2016) and Denmark (Thomsen et al., 2018) have, however, presented a somewhat sobering picture with control groups subjected to treatment as usual reducing their utilization of inpatient treatment in equal proportions to or even more than self-admission participants (Strand & von Hausswolff-Juhlin, 2018). The self-admission program at the Stockholm Centre for Eating Disorders (SCÄ) described in the present article is the first to target patients with an eating disorder.

We have previously presented a qualitative study on participants' experiences of self-admission in this journal (Strand, Bulik, et al., 2017). In brief, participants with AN reported a high level of satisfaction with the program and experienced increased agency and motivation. They described how self-admission could provide a safety net that led to strengthened feelings of security in everyday life. However, they also reported that the model requires a certain level of maturity and an encouraging environment to overcome barriers such as ambivalence that could otherwise hinder optimal use. To this date, no study on how self-admission affects quantifiable outcomes, such as healthcare utilization or eating disorder morbidity, for patients with AN has been published.

1.1 | Objective

The aim of this study was to evaluate the impact of a self-admission program on healthcare utilization, eating disorder morbidity, health-related quality of life (HRQoL), and sick leave for patients with AN. Our primary hypothesis was that participants in the self-admission program would reduce their overall time spent in inpatient treatment compared to a matched comparison group. Secondary hypotheses were that participation would also favorably affect eating disorder morbidity, HRQoL, and days on sick leave.

2 | METHOD

2.1 | Setting

The present study was conducted at SCÄ, which is a public sector specialist service for the treatment of eating disorders in Stockholm, Sweden, run by the Stockholm County Council. The catchment area is Metropolitan Stockholm with a population of 2.2 million. Treatment at the hospital is publicly funded, with only minor patient fees in consonance with all Swedish public healthcare; the per diem patient fee for inpatient treatment (regular as well as self-admission) is currently equivalent to 10 United States dollars.

At the adult inpatient ward, two beds out of 11 are reserved for patients in the self-admission program. Regular admissions to the

remaining nine beds are initiated by the outpatient units on an elective basis; these are usually voluntary admissions, although involuntary commitment according to Swedish law also occurs. Due to the often prolonged nature of these regular admissions, the patient turnover at the ward is low and there is typically a several weeks wait for regular admission. No emergency admissions are available; instead, emergency cases are routinely handled by general psychiatry or somatic healthcare. Overall, the inpatient treatment provided at the hospital would probably best be described as residential care in a United States setting.

To be eligible for the self-admission program, patients must maintain continuous treatment contact at the adult outpatient or day-treatment units. They must have had at least one treatment episode in the adult inpatient ward during the past 3 years, so that they are familiar with the treatment framework. Exclusion criteria for the program are current suicidal or high-risk self-injurious behavior, the presence of an untreated substance use disorder, and/or medical instability requiring urgent somatic inpatient treatment; these are the same exclusion criteria used for regular inpatients at the ward. No criteria specifically related to body-mass index (BMI) are applied. Usually, participation in the program is suggested by a patient's treatment contact at the inpatient ward or outpatient clinic and an in-depth discussion of the rationale behind the model is held before the patient makes a decision. Participants can admit themselves at will for a maximum of 7 days by contacting the ward directly. There is no explicit limit on how often participants can self-admit. If both designated beds are already occupied by another patient in the program, a waiting list is established.

The self-admission contract is valid for 1 year, with the possibility of renewal annually. Importantly, self-admission is constructed as an add-on treatment option and regular admission is still available for participants if necessary.

2.2 | Study design and participants

In this cohort study, the outcomes at 12-month follow-up for participants in the self-admission program were analyzed alongside those of two comparison groups. All 34 patients who were offered to partake in the self-admission program at SCÄ between August 2014 and February 2019 were invited to participate in the study. None declined to have their healthcare utilization data collected, although a few did not actively participate in completing baseline or follow-up questionnaires. Therefore, *n* varies somewhat for different outcome parameters presented in Section 3. A few participants ended up staying in the program <6 months (due to ending the treatment contact at SCÄ because of remission, suicide attempt, or substance use) and were not assessed at 12-month follow-up. Therefore, a total of 29 participants constituted the participant cohort. One patient committed suicide after 11 months in the program; her data up until that point were included in the analyses. For the remaining 28 participants, data on their first 12 months in the program were included. All participants had an AN diagnosis as defined in the *International Classification of Diseases, 10th Revision* (albeit in some cases partly in remission). Many, but not all, fulfilled suggested criteria for SE-AN (Wonderlich et al., 2020). An a priori estimation of statistical power using G*Power 3.1.9.2 based on the medium effect sizes seen in available Norwegian data (Strand & von Hausswolff-Juhlin, 2015) and assuming a two-sided null hypothesis of no effect suggested that power above 80% would be achieved at a level of 26 participants.

A larger comparison group was established using the national eating disorder quality register Stepwise, which has been found to be valid and reliable (Birgegård, Björck, & Clinton, 2010; Emilsson, Lindahl, Köster, Lambe, & Ludvigsson, 2015). During the years covered by this study, data on patients in treatment at specialist eating disorder services throughout Sweden were routinely entered into Stepwise, and individuals from this source thus represent a "treatment as usual" population in comparison to the participants who received eating disorder specialist treatment with self-admission as an add-on tool. By definition, the individuals identified in the Stepwise register were enrolled in eating disorder specialist treatment and had access to inpatient treatment, although the exact access may vary somewhat according to geography. Participants and the comparison group were matched based on age, duration of illness, and BMI. We also attempted to use gender as a matching parameter, but this was not possible due to a low number of men in corresponding age spans. Eating disorder diagnosis was not used as a matching parameter; it was assumed that since all participants had an AN diagnosis (albeit in some cases in partial remission), using BMI as matching parameter would result in an adequate diagnostic match. Ethical permits allowed for a 1:10 ratio of participants to comparison group; however, due to a scarcity of individuals with matching severity of illness in the register, a 1:4 ratio was achieved. However, for two participants it was only possible to identify two and three adequate matches, respectively. Thus, the comparison group comprised 113 individuals in total who were included in the Stepwise register between 2013 and 2017.

As described in Section 3, although a satisfactory baseline match was achieved in terms of age, gender, duration of illness, and BMI, the two groups differed in terms of previous healthcare utilization—this was largely due to the fact that a majority of individuals in the comparison group had no days in inpatient treatment in the 12 months prior to inclusion in the Stepwise database. Therefore, the larger comparison group is referred to as the "low-utilization comparison group." Separate sensitivity analyses were performed whereby only those individuals in the larger comparison group who had received inpatient treatment in the 12 months before baseline were included. In the following, this group, comprising 27 individuals who were a somewhat better match in terms of days spent in inpatient treatment, is referred to as the "moderate-utilization comparison group."

Additional data on comorbidity were retrieved from the National Patient Register (see outcome measures in section 2.3). Data on the occurrence of binge-purge behaviors as part of a patient's eating disorder were retrieved from the Stepwise register.

2.3 | Outcome measures

For analyzing healthcare utilization, this study makes use of the high-quality nationwide registers maintained by the Swedish government,

which covers the Swedish population in its entirety (Ludvigsson et al., 2016). Specifically, data on the number of days in and frequency of inpatient treatment, number of days in involuntary inpatient treatment, and number of outpatient visits during 12 months prior to and after baseline were retrieved from the National Patient Register, kept by the Swedish National Board of Health and Welfare. Specific data on participants' self-admission episodes were retrieved from patient records.

To evaluate impact on eating disorder morbidity, changes in BMI, Eating Disorders Examination Questionnaire (EDE-Q) 6.0 scores, and Clinical Impairment Assessment Questionnaire (CIA) 3.0 scores between baseline and 12-month follow-up were assessed. EDE-Q is a self-report instrument consisting of 28 items and 3 additional questions that measures features of psychopathology related to an eating disorder, generating a global score and scores on four subscales: restraint, eating concern, shape concern, and weight concern (Fairburn & Beglin, 2008, 1994). CIA is a 16-item self-report instrument measuring the severity of psychosocial impairment due to an eating disorder (Bohn et al., 2008; Bohn & Fairburn, 2008). EDE-Q and CIA have both been translated and validated for use in a Swedish setting (Welch, Birgegård, Parling, & Ghaderi, 2011). Moreover, the Global Assessment of Functioning (GAF) scale included in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 1994) was used. Unfortunately, the number of individuals in the comparison groups with available follow-up data on eating disorder morbidity and GAF were too small to allow for meaningful statistical analyses.

To evaluate impact on participants' HRQoL, the generic preference-based self-report instruments EQ-5D-3L (from here on referred to as EQ-5D) and the Short Form 36 (SF-36) were used, both of which are widely used measures of general health in clinical studies throughout the world. EQ-5D assesses five attributes of health—mobility, self-care, usual activities, pain/discomfort, and anxiety/depression—on three severity levels (Drummond, Sculpher, Claxton, Stoddart, & Torrance, 2015). The instrument also contains a visual analog scale (VAS) where respondents rate their overall health state on a 0–100 scale. The respondent answers on EQ-5D can be transformed into a single-index health status value, which has been developed using a time trade-off approach (Drummond et al., 2015). In the present study, country-specific experience value sets for Sweden were used (Burström et al., 2014). SF-36 consists of 36 items generating eight dimension scores and two summary scores for physical and mental health. These scores can then be transformed into a single-index measure known as SF-6D, which has been developed based on standard gamble measurements (Drummond et al., 2015). Since no country-specific SF-6D preference value set is available for Sweden, utility scores developed in the United Kingdom and licensed by the University of Sheffield were used (Brazier, Roberts, & Deverill, 2002). Participants' HRQoL was assessed at baseline and at 12 months follow-up; however, it was not possible to obtain HRQoL data for the comparison groups.

Data on sick leave for participants and comparison groups were retrieved from the Longitudinal Integrated Database for Health Insurance and Labor Market Studies (LISA) at Statistics Sweden, which comprise aggregated data from the Swedish Social Insurance Agency (SIAS). All Swedish residents aged 16–64 years are covered by universal health insurance and receive economic support if their ability to work is limited due to sickness, injury, or disability. Various forms of benefits exist. For the present study, data on sick leave, sick leave for rehabilitation, and disability leave (from here on collectively referred to as "sick leave") were collected. The first day of sick leave is not compensated and the 13 days that follow are compensated by the employer. After this, the benefits are paid for by SIAS. Therefore, periods of sick leave <14 days are not registered in the database, except for students and the unemployed. At the time of analysis, data on sick leave up until 2017 were available in the LISA database. For a small number of participants who were included after January 1, 2018, additional sick leave data were obtained from patient records.

2.4 | Statistical analysis

For all statistical analyses, IBM® SPSS® Statistics 26 was used. For eating disorder morbidity and HRQoL where data before and after inclusion were compared, paired *t*-tests were performed. For data on healthcare utilization during the 12 months before and after inclusion, the differences between pairs were generally not normally distributed. Thus, for these data, we performed Wilcoxon signed-rank tests.

Regarding sick leave, aggregated data are available in the LISA database at full-year level only. Thus, in the assessment of changes in sick leave, data were analyzed over three time-points: the full year before inclusion, the full baseline (inclusion) year, and the full year after inclusion. Mauchly's sphericity test showed that sphericity could be assumed for participant and moderate-utilization comparison group data but not for the low-utilization comparison group data. A repeated measures analysis of variance (with Greenhouse–Geisser correction for the low-utilization comparison group) was performed.

In all analyses, an α level of <.05 was considered statistically significant. Bonferroni corrections were also applied to compensate for multiple comparisons. For statistically significant paired *t*-tests, Cohen's *d* effect sizes were calculated, considering values around 0.2 as small, 0.5 as medium, and 0.8 as large. Calculating effect sizes for nonparametric data is not a straightforward task. For statistically significant Wilcoxon signed-rank tests, we chose to use the matched-pair rank-biserial correlation suggested by Kerby (2014) in assessing effect sizes.

2.5 | Ethics, pre-registration, and adherence to reporting guidelines

All procedures were conducted in accordance with the Helsinki declaration. The study was approved by the Regional Ethical Review Board in Stockholm, Sweden (Nos. 2014/1586-31, 2015/1537-32, 2018/1184-32, and 2020-00831). Informed consent was obtained from all participants prior to inclusion. The study protocol was pre-registered

at ClinicalTrials.gov (ID: NCT02937259). Notably, the protocol was later updated and aligned with other studies in the field to allow for the use of matched comparison groups as described earlier. In reporting our findings, we have adhered to the STROBE statement on improving the quality of reporting of observational studies (von Elm et al., 2007).

3 | RESULTS

Baseline characteristics of participants and the low- and moderate-utilization comparison groups are provided in Table 1. As seen, although a good match was achieved in terms of gender, age, duration of illness, and BMI, the three groups differed in terms of comorbidity; most obviously, a personality disorder diagnosis was much more common in the moderate-utilization comparison group. Furthermore, both comparison groups more often displayed binge-purge behaviors, whereas participants in the self-admission program more often had an ADHD/ADD or autism diagnosis.

Figure 1 illustrates participants' inpatient treatment utilization in the 12 months prior to and after inclusion; here, a large increase in admission frequency corresponded to a sharp decrease in the number of days spent in hospital. Data on healthcare utilization across the three groups are provided in Table 2. Overall, a significant reduction in participants' utilization of inpatient treatment was seen, which remained after Bonferroni correction. This corresponded to a matched-pairs rank-biserial correlation level of 0.73; i.e., a medium to large effect size.

Data on eating disorder morbidity and GAF for participants are provided in Table 3. Overall, a significant slight increase in BMI was seen, corresponding to a Cohen's *d* of 0.45; i.e., a medium effect size. However, this change was not significant after Bonferroni correction. Moreover, a significant increase in GAF score was seen, corresponding to a Cohen's *d* of 0.61; i.e., a medium effect size.

Data on changes in participants' HRQoL are presented in Table 4. Here, no major changes in terms of the EQ-5D single-index value or the SF-36 standard gamble health state variation were seen; it can be noted that the participants scored fairly high at baseline on these measures. An analysis of item-level distribution of EQ-5D data did not reveal any major changes. In contrast, a significant increase in terms of EQ VAS was seen, corresponding to a Cohen's *d* of 0.78; i.e., a large effect size.

See Figure 2 for absolute numbers regarding the three time-point longitudinal data on sick leave. There was an overall significant difference in the mean number of sick leave days between time points for the low-utilization comparison group (F[1.836, 205.597] = 6.378, p = .003) and for the moderate-utilization comparison group (F[2, 52] = 3.462, p = .039), but not for participants (F[2, 56] = 3.078, p = .054). However, pairwise comparisons revealed that for participants, the increase in the mean number of sick leave days between the year before inclusion and the baseline year was significant (p = .012), whereas the decrease between the baseline year and the year after inclusion was not (p = .090). Hence, there was a discrepant pattern in the participant group vs. both comparison groups. All three groups displayed an increase in days on sick leave between the year before inclusion and the baseline year. However, the two comparison groups displayed a further increase in sick leave days between the baseline year and the year after inclusion, whereas the participant group displayed a parallel decrease (even though it did not reach statistical significance).

TABLE 1 Baseline characteristics of participants and comparison groups

	Participants	Low-utilization comparison group	Moderate-utilization comparison group
n	29	113	27
% women	93.2	98.2	96.3
Years of age	29.7 (10.6)	27.8 (10.4)	30.2 (12.3)
Duration of illness in years	13.4 (10.6)	11.7 (10.5)	14 (12.3)
BMI	15.8 (2.3)	16.5 (1.8)	15.8 (1.6)
EDE-Q global score	3.3 (1.2)	3.5 (1.4)	3.6 (1.7)
CIA score	30.0 (10.4)	31.1 (10.4)	34.3 (10.3)
% with binge-purge behaviors	10.3	39.8	25.9
% with affective disorder	55.2	30.1	44.4
% with anxiety disorder	41.4	31.0	51.9
% with OCD	13.8	8.8	14.8
% with personality disorder	6.9	9.7	25.9
% with ADHD/ADD	10.3	4.4	3.7
% with autism	6.9	1.8	3.7

Note: Values are means unless otherwise indicated. *SD*s are presented in parentheses wherever applicable.
Abbreviations: ADD, attention-deficit disorder; ADHD, attention-deficit/hyperactivity disorder; BMI, body-mass index; CIA, Clinical Impairment Assessment Questionnaire; EDE-Q, Eating Disorder Examination Questionnaire; OCD, obsessive–compulsive disorder.

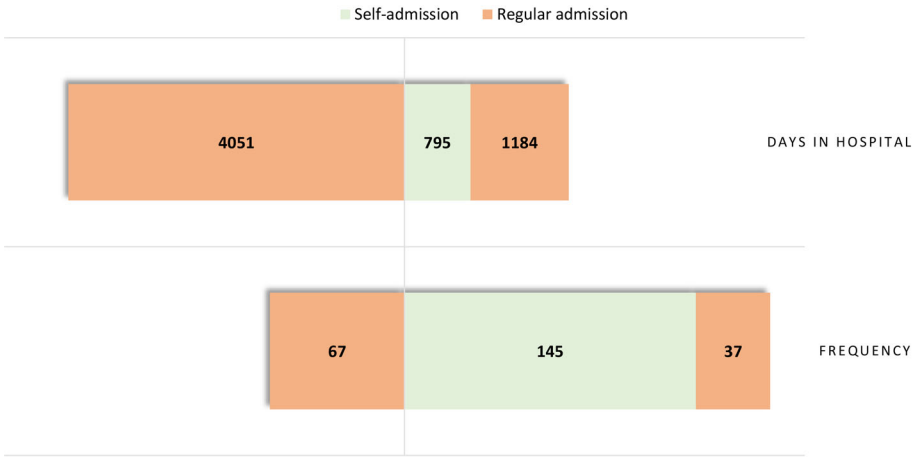

FIGURE 1 Participants' utilization of inpatient treatment in terms of number of days spent in hospital and admission frequency during the 12 months before (left of middle baseline) and after (right of middle baseline) inclusion [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 2 Changes in health care utilization in participants and comparison groups

		Before				After						
		Mean	25th pctl.	50th pctl.	75th pctl.	Mean	25th pctl.	50th pctl.	75th pctl.	% Change	*Z*	*p*
Participants (*n* = 29)	Days in inpatient treatment	139.7	80.5	124.0	180.0	68.2	3.5	31.0	119.0	−51.1	−3.406[a]	.001
	Number of admissions	2.3	1.0	1.0	3.0	6.3	1.0	4.0	11.0	+171.7	−3.193[b]	.001
	Days in involuntary inpatient treatment	10.3	0.0	0.0	0.0	9.4	0.0	0.0	0.0	−9.3	−0.105[b]	.917
	Number of outpatient visits	11.5	5.5	8.0	13.0	12.8	6.5	11.0	16.0	+11.7	−0.974[b]	.330
Low-utilization comparison group (*n* = 113)	Days in inpatient treatment	17.0	0.0	0.0	0.0	22.9	0.0	0.0	2.5	+34.7	−1.128[b]	.259
	Number of admissions	0.5	0.0	0.0	0.0	0.7	0.0	0.0	1.0	+36.8	−1.607[b]	.108
	Days in involuntary inpatient treatment	4.4	0.0	0.0	0.0	3.2	0.0	0.0	0.0	−28.0	−0.204[a]	.838
	Number of outpatient visits	3.4	0.5	1.0	4.5	4.0	1.0	2.0	6.0	+18.5	−1.416[b]	.157
Moderate-utilization comparison group (*n* = 27)	Days in inpatient treatment	71.0	4.0	32.0	112.0	62.4	0.0	24.0	105.0	−12.1	−0.961[a]	.336
	Number of admissions	2.2	1.0	2.0	3.0	2.1	0.0	1.0	3.0	−6.7	−0.324[a]	.746
	Days in involuntary inpatient treatment	18.4	0.0	0.0	0.0	6.1	0.0	0.0	0.0	−70.0	−1.014[a]	.310
	Number of outpatient visits	6.7	2.0	5.0	9.0	6.5	2.0	4.0	9.0	−2.8	−0.305[a]	.761

[a]Based on positive ranks.
[b]Based on negative ranks (Pctl. = percentile).

TABLE 3 Changes in eating disorder symptomatology and global assessment of functioning among participants

	Before	After	% Change	*p*	*n*
BMI	15.8 (2.3)	16.7 (2.5)	+6.1	.023	29
EDE-Q global score	3.2 (1.2)	2.9 (1.2)	−8.1	.203	23
EDE-Q restraint	2.8 (1.7)	2.6 (1.7)	−7.1	.492	23
EDE-Q eating concern	2.4 (1.1)	2.1 (1.0)	−10.3	.308	23
EDE-Q weight concern	3.3 (1.3)	3.1 (1.4)	−6.1	.411	23
EDE-Q shape concern	4.2 (1.3)	3.9 (1.4)	−9.0	.095	23
CIA	30.0 (9.0)	27.5 (8.4)	−8.3	.272	18
GAF	31.2 (11.0)	41.5 (16.7)	+33.0	.007	24

Note: Values are means unless otherwise indicated. *SD*s are presented in parentheses wherever applicable.
Abbreviations: BMI, body-mass index; CIA, Clinical Impairment Assessment Questionnaire; EDE-Q, Eating Disorder Examination Questionnaire; GAF, Global Assessment of Functioning.

TABLE 4 Changes in participants' health-related quality of life

	Before	After	% Change	*p*	*n*
EQ-5D single-index value	0.7682 (0.1328)	0.8024 (0.1528)	+4.4	.084	23
EQ visual analog scale	44.8 (15.3)	56.2 (21.0)	+25.6	.001	22
SF-36 standard gamble health state variation	0.614 (0.053)	0.639 (0.086)	+4.2	.056	22

Note: Values are means unless otherwise indicated. *SD*s are presented in parentheses wherever applicable.

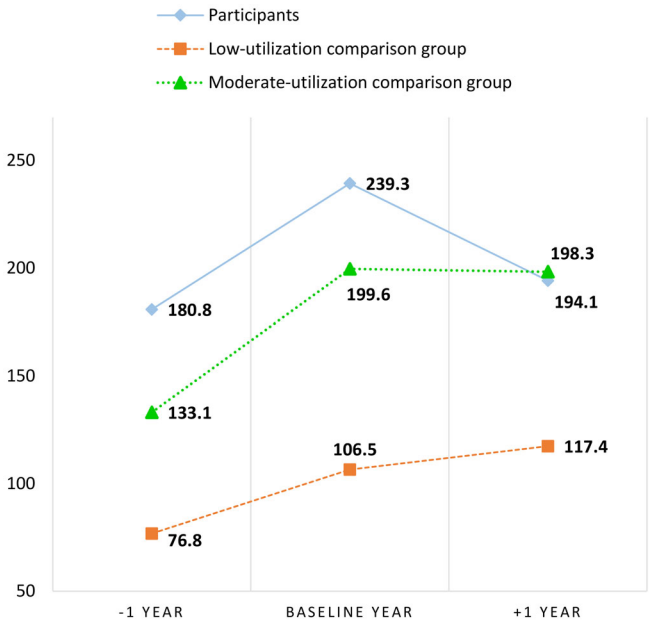

FIGURE 2 Changes in mean number of sick leave days over three time-points for participants and comparison groups [Color figure can be viewed at wileyonlinelibrary.com]

4 | DISCUSSION

The present study reveals that participants in a self-admission program for patients at a specialist eating disorder service displayed a more than 50% reduction in time spent hospitalized at 12-month follow-up, compared to small and statistically nonsignificant changes in low- and moderate utilization comparison groups. In contrast, the approach did not significantly affect participants' BMI or eating disorder morbidity. In terms of HRQoL, mixed results were seen with a 25% improvement on the overall EQ VAS, but no changes in more specific measures. There were no significant effects on the time spent in involuntary inpatient treatment or on the number of outpatient visits between groups. For number of sick leave days, a beneficial pattern was seen for the participant group; however, this did not reach statistical significance.

Taken together, these findings indicate that whereas being offered self-admission as a treatment tool helped participants prevent deterioration and reduce their need for inpatient treatment, it did not help them achieve symptom remission. Although we initially hypothesized that self-admission would also have some positive impact on eating disorder morbidity, the present findings are understandable given that the brief nature of these admissions means that they do not allow for complete weight restoration or the achievement of other long-term goals (Strand et al., 2015). Instead, they primarily represent "booster" opportunities or brief respites at times when the risk of deterioration is high. Previous qualitative research shows that participants mostly use self-admission in order to prevent prolonged hospital admission, boost healthy routines, and get a break from hardships in everyday life, rather than in hopes of achieving full remission (Strand, Bulik, et al., 2017). Considering that the targeted participant group displayed a mean duration of illness of 13.4 years, self-admission certainly does not provide a quick fix or catch-all solution. As an illustration, although participants displayed improved functioning as measured by GAF, on average these changes corresponded to moving from "major impairment in several areas" (range 30–40) to "serious impairment in social, occupational, or school functioning" (range 40–50) (American Psychiatric Association, 1994) for all groups, indicating serious remaining functional impairment.

Based on these findings, self-admission is perhaps best understood within a recovery model framework. In this model, which stems from the consumer-advocacy movement, a distinction between recovery *from* and recovery *in* a disorder is made (Davidson & Roe, 2007). Whereas recovery from a disorder emphasizes a traditional notion of cure, the concept of recovery in a disorder implies that even though patients may still fulfill diagnostic criteria for certain disorders, they have access to tools that help them manage symptoms and lead a more fulfilling life in spite of not being formally cured. It has been suggested that the recovery model might have particular relevance for individuals with longstanding AN (Dawson, Rhodes, & Touyz, 2014) and there are numerous examples of treatment approaches incorporating aspects of the recovery model, harm reduction principles, and so forth for this patient group (Kaplan & Miles, 2016; Molin, von Hausswolff-Juhlin, Norring, Hagberg, & Gustafsson, 2016; Russell, Mulvey, Bennett, Donnelly, & Frig, 2019; Wildes et al., 2016; Williams, Dobney, & Geller, 2010). However, others have highlighted that improvement in SE-AN patients' HRQoL may still primarily rely on symptom change and that clinicians should not precipitously abandon weight gain and change in behavioral symptoms as treatment goals (Bamford et al., 2015). Based on our findings, self-admission seems to fit well within a recovery model framework of increased focus on patient autonomy and empowerment. Participants with eating disorders in self-admission programs are generally satisfied with the model (Strand, Bulik, et al., 2017). This, however, is unsurprising given that they are offered increased access to a scarce resource—hospitals beds—in psychiatry (Strand & Sjöstrand, 2019). The present study

offers the first concrete evidence that the self-admission model can actually help participants with SE-AN achieve quantifiable goals such as reducing their need for inpatient treatment, even if this does not promote symptom remission. With this in mind, it is advisable for clinicians and patients to discuss reasonable expectations before entering into the program, in order to instill a nuanced understanding of the self-admission concept (Strand, Gustafsson, Bulik, & Hausswolff-Juhlin, 2017). Importantly, self-admission is an add-on tool and should not replace a focus on remission wherever appropriate.

Previous qualitative research has showed that participants highly valued the "safety net" function of self-admission and that they believed that the program helped them expand their scope of everyday activities (Strand, Bulik, et al., 2017). Therefore, the very modest findings in the present study regarding changes in HRQoL are surprising. Here, a number of observations can be made. A marked improvement was seen in terms of EQ VAS, whereas no significant improvement was seen in the EQ-5D single-index value—notably, the scores on the latter were already relatively high at baseline. This may reflect a failure of the main five-item part of EQ-5D to adequately capture everyday obstacles experienced in AN. For example, participants generally scored high on items related to mobility and self-care—indeed, many of the participants engaged in excessive physical exercise as a part of their AN symptomatology and considered themselves highly mobile. Furthermore, upon closer scrutiny participants' SF-36 data reveal that many of those who scored low on items related to their own well-being also answered that their health was no worse than that of other people they know, inflating total scores. This could hypothetically reflect a limited social network; not least, after prolonged treatment episodes some SE-AN patients may mostly know others in similar situations. It was also observed that many of those who answered that their subjective well-being had improved also scored higher on items related to specific everyday difficulties on follow-up. This may reflect an increased insight into one's own problems over time (Gorse, Nordon, Rouillon, Pham-Scottez, & Revah-Levy, 2013), whereas baseline answers may present a more "glossy" picture colored by AN cognitions. As patients change, the basis on which they appraise their HRQoL may also change, a phenomenon known as response shift (Schwartz, Andresen, Nosek, & Krahn, 2007). Issues such as these make the EQ-5D and SF-36 outcomes somewhat difficult to interpret in the present context. The relatively straightforward EQ VAS—on which our participants displayed a 25% improvement—may therefore be a better indicator, although the use of VAS may also be associated with problems such as end-of-scale and context bias (Drummond et al., 2015). Of course, analogous to the GAF findings discussed earlier, a mean EQ VAS score of 56.1 (on a scale from 0 to 100) at follow-up still indicates a remaining severe impairment in HRQoL.

It is not possible to tell whether the beneficial pattern in number of sick leave days seen in the participant group was due to improved health status or if it was simply a result of the reduction in time spent hospitalized. Importantly, since periods of sick leave <14 days are not registered in the LISA database, one reason for the observed reduction could be that sick leave during the brief self-admission episodes was not fully captured.

The findings reported here should be considered in the light of several limitations. Implementing a service delivery intervention such as self-admission may not be feasible in all countries, as healthcare systems vary widely (Strand et al., 2015; Wonderlich et al., 2020). The small number of participants limits statistical power and makes it difficult to assess effects of a lesser magnitude. Statistical power was calculated based on the assumption that favorable changes of a relatively large magnitude would be necessary in order to justify the allocation of resources to the self-admission program. Even so, there could have been clinically relevant changes in outcomes of a lesser magnitude that were not fully captured. The highly naturalistic study setting meant that a large proportion of eligible participants—i.e., known patients with severe AN in the Metropolitan Stockholm area—were invited to participate in the program at some point. With around 2000 active treatment contacts and 1,200 new patients yearly, SCÄ is a large-scale specialist service by international standards. Even so, the number of eligible participants was ultimately limited. Indeed, it has been noted that more collaborative efforts are necessary since many services only have a small number of SE-AN patients on their caseload (Wonderlich et al., 2020).

This also affected the chances of achieving an optimal match between participants and comparison groups. A satisfactory baseline match between groups was achieved regarding age, duration of illness, and BMI. However, further matching based on previous healthcare utilization or sick leave was not feasible since it would have required running cross-database queries involving different government agencies. Further analysis showed that the participant group displayed a much higher level of previous healthcare utilization than the comparison groups, even when comparison individuals with no inpatient treatment during the previous 12 months were removed. This can be expected given that the participants constitute a highly selected group that has been included in the program precisely on the grounds of having required inpatient treatment in the past. Even so, baseline matching in terms of previous healthcare utilization was far from optimal, which limits the comparability. The comparison group results should therefore merely be seen as a reference indication of how patterns in patients with longstanding eating disorders and low or moderate utilization of inpatient treatment evolve over time. The mean 71 days of inpatient treatment in the previous 12 months observed in the moderate-utilization comparison group indicate that these patients arguably spent relatively much time in hospital, although not quite as much as the participant group.

There are several potential reasons for these discrepancies. Considering the differences in comorbidity, the higher need for hospitalization among moderate utilizers could in fact be related to the overrepresentation of personality disorders in this group. In contrast, participants were more likely to suffer from restricting subtype AN and more often had an ADHD/ADD or autism diagnosis—these characteristics may coincide and imply a poorer treatment response over time (Westwood & Tchanturia, 2017). Moreover, baseline BMI, although moderately to severely low, was not in the extreme range (as outlined in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders*) for any of the groups. Among participants, who had

spent more time hospitalized in the previous 12 months, this could imply that they had initially had an even lower BMI that had prompted inpatient treatment in the first place and that their baseline BMI represented a relatively higher body weight after discharge. In contrast, for the low-utilization comparison group in particular, baseline BMI might have been more stable over time, since their status had obviously not prompted inpatient treatment in the previous 12 months despite a longstanding severe illness.

Perhaps most importantly, even though the self-admission program is in and by itself a novel and experimental approach to treatment, it was not possible to conduct a formal experimental study of the model. Due to the fact that the Stockholm County Council made a decision early on to roll out self-admission on a broader scale even though its effectiveness had not yet been trialed, it was not possible to randomly allocate eligible patients to either active participation in the program or a control condition—this would have meant that patients were not offered treatment on equal terms, which is unacceptable once a treatment tool is established as a standard option. Thus, the intervention had to be evaluated using a cohort study approach.

In future studies of similar programs, an alternative could be a so-called stepped wedge cluster randomized trial approach—a study design increasingly being used in the evaluation of service delivery interventions (Hemming, Haines, Chilton, Girling, & Lilford, 2015). In a stepped wedge trial, services (e.g., hospital wards) rather than individual patients are randomized to the sequential implementation of a novel intervention over a specified time period until patients at all sites have been exposed. Thus, every site eventually switches from control status to exposure status but at various time points. A stepped wedge design is explicitly recommended in situations where logistical and political constraints exist, such as when stakeholders (e.g., managers or politicians) wish to roll out a novel intervention on a broader scale based partly on attentiveness to constituents who may not accept that a government would randomly assign citizens to government programs (Hemming et al., 2015).

4.1 | Conclusion

This is the first study to report the effects of self-admission as a tool in the treatment of patients with AN on healthcare utilization, eating disorder morbidity, HRQoL, and sick leave. Participants in the self-admission program displayed a more than 50% reduction in time spent hospitalized at 12-month follow-up, compared to small, nonsignificant changes in comparison groups. In contrast, the approach did not affect participants' BMI or eating disorder morbidity. In terms of HRQoL, participants reported a 25% improvement on the overall VAS measure but no changes on more specific measures. These findings indicate that self-admission is a viable and helpful tool within a recovery model framework, even though it does not lead to symptom remission. In its proper context, self-admission could potentially transform healthcare from crisis-driven to pre-emptive, and promote autonomy for severely ill patients.

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CONFLICT OF INTEREST

C. M. B. is with Shire (grant recipient, Scientific Advisory Board member); Idorsia (consultant); and Pearson (author, royalty recipient).

DATA AVAILABILITY STATEMENT

Study data are available from the corresponding author on reasonable request.

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